LETTERS TO THE EDITOR.

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The Directorship of the Natural History Museum.

A RETROSPECT of fifteen to twenty years will show the effect in action of the proposed appointment of a Civil Servant to be director of the Natural History Museum.

The Science Museum adjacent had then been handed over to the direction of a Civil Service official, acting, apparently, on secret instructions that the collection of machinery and models initiated by Bennet Woodcroft was too great an expense for this country to maintain, although something less than one of our numerous Lord Chancellors; and a "ca' canny" policy was to be adopted until the director had qualified for the higher scale, when the museum was to be closed.

But the science collection was saved by a miracle from dispersal, and a competent man appointed to direct in the late Mr. Last. Too late, unfortunately, for him to secure such trophies as a broad-gauge express locomotive or the paddle-engines of the *Great Eastern,* to be had as a gift, and erected outside in the open if there were no funds to house them.

The historical collection was the envy of Germany, which would have bid for it, if the chance had come, to serve as the nucleus of the magnificent museum in imitation at Munich, on which no expense was spared to make it perfect and complete.

Prof. Klein was on a visit of inspection at the time to collect ideas for the projected Munich Museum, and I felt humiliated for England that he should glimpse our official mentality, and hear the low opinion held of the value of our own work, as I accompanied him round.

Quieta non movere is the motto of the old Government official. But the first act of Mr. Last's appointment was to set the collection of models at work by compressed air.

The collection grew out of the old Patent Museum, under the care of Bennet Woodcroft, encouraged by Cole, and housed in the Brompton "Boilers," Thackeray's name for the corrugated-iron sheds.

It is melancholy to reflect on the glorious chances lost by the niggardly policy lasting up to the war. The office of Master-General of the Ordnance had been re-established, entrusted with our military preparedness; and why not that of the Master-General of the Mechanicks, as Sir Samuel Morland was, for title of the director, chosen as an enthusiast, always on the look-out for additions?

But there has been no director of the Science Museum since Mr. Last. The Government official is suspicious of the competent man. G. GREENHILL.

1 Staple Inn, W.C.1, March 8.

Absorption of Gases by Charcoal.

OF late years much attention has been given to the remarkable power of charcoal to absorb gases of all kinds, and during the war extensive use has been made of this property in the construction of masks for removing noxious gases from the air inhaled by the wearer. As a matter of justice to the memory of a man whose interesting work in the chemistry of vegetable products is apt to be forgotten, I should like to remind readers of NATURE that the first practical application of charcoal for such purposes was made by Dr. John Stenhouse, lecturer in chemistry at St. Bartholomew's Hospital. In 1854 Stenhouse devised a charcoal respirator consisting of a perforated zinc case filled with granular wood charcoal, and adapted to fit over the mouth and nose. Respirators of this kind were in use by nurses and dressers in St. Bartholomew's, and, I believe, some other hospitals, down to the time when Lister's antiseptic system rendered such protection from the offensive emanations of sores unnecessary. When I worked in Stenhouse's private laboratory in 1862–63 he gave me one of these respirators, and I made use of it long afterwards with great advantage when experimenting on the gases from *aqua regia* and other irritating substances.

Stenhouse further succeeded in inducing the authorities of the City of London to make use of charcoal as a deodorant of the gases liable to escape from the gullies in the streets, in which application it was quite satisfactory so long as it was kept dry. The difficulty of excluding water and mud from the trays on which the charcoal was placed led, after a few years, to the abandonment of the system in the streets. The letter addressed by Stenhouse to the Lord Mayor in February, 1860, on the subject was reviewed in the *Chemical News* (vol. iii., p. 78). In the same journal (vol. xxv., p. 239) there is a letter from Stenhouse dated May, 1872, in which he refers to his respirators as then coming into use in chemical laboratories. WILLIAM A. TILDEN.

February 28.

The Profession of Chemistry.

THE admirable article under the above title in the issue of NATURE for February 27 will be welcomed by all who cherish the belief that active development of chemical study is vital to the welfare of the State, and modestly hope that public recognition of this fact, so long deferred, may be acknowledged before it is too late. I am convinced, however, that this recognition will not be accorded until the question of nomenclature, to which you refer, has been arranged satisfactorily.

Schools and universities are not the only seats of learning. The street is one; its influence is persistent and universal, for practically all sections of the community, excepting Outer Hebridesians and Scotch crofters, come, sooner or later, under the spell of its suggestion. Yet every day, from childhood to the grave, we are told by the street that a chemist is identical with a pharmacist, and principally occupied in dispensing medicine and in the sale of toilet requisites. Is it surprising that the public is still unaware of the basic fact that the principles of chemistry lie at the foundation of our great national industries and of all the forms which life itself assumes?

In the exercise of his craft the baker practises daily some curious operations in organic chemistry which are not even yet understood by organic chemists themselves. Supposing that some enterprising baker early in the nineteenth century had called himself a "chemist and baker," that the idea had been embraced by the whole body of bakers, and that the public, in purchasing jam-tarts or cake, had become accustomed to passing under the sign of the "Chemist and Baker," would it not be excusable if the much abused public hazily associated confectionery with argon, T.N.T., or British dyes?

The only remedy for the present situation is courteously to approach the Pharmaceutical Society and endeavour to establish a friendly arrangement, in conformity with which the members of that body, who are now variously denominated "chemist," "pharmacist," and "druggist," would content themselves

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with two of these names, leaving the first word for the definition of persons engaged more obviously in the extension of chemical knowledge or the application of chemical principles.

Pharmacy is an honourable occupation, and I cannot believe that the pharmacist would lose dignity or status by the change. Comparatively few pharmacists are chemists in the modern sense, and it is well known that in other great countries this confusion of titles does not prevail; in fact, this is one of the few points on which we are at variance with our Allies, whilst they are in complete harmony with the Hun.

M. O. FORSTER.

Savage Club, W.C.2, March 4.

Graphic Methods in Nautical Astronomy.

IN the issue of NATURE published on October 24 last (vol. cii., p. 155) there appeared an account of an ingenious chart devised by Mr. G. W. Littlehales, of the United States Hydrographic Department, for dealing rapidly with certain problems in nautical astronomy which involve the solution of a spherical triangle when the three sides, or the two sides and the included angle, are known. The article is entitled "A New Graphic Method in Nautical Astronomy," but it would appear that the idea has been familiar in France for more than five-and-twenty years. The possibility of constructing a chart like that made by Mr. G. W. Littlehales was demonstrated by Maurice d'Ocagne so long ago as 1891 in his work "Nomographie: les calculs usuels effectués au moyen des abaques," p. 84, and an abacus devised by him on these lines was described in W. Dyck's "Katalog mathematischer und mathematisch-physikalischer Modelle, Apparate und Instrumente," published in 1892, p. 163. A figure of the chart can be found in a paper by d'Ocagne which appeared in the *Journal de l'Ecole Polytechnique* (second series, 4th cahier, 1898, p. 224), and also in his "Traité de Nomographie," 1899, p. 328. In a modified form the chart was employed by E. Collignon in 1898 (see his "Note sur la détermination de l'heure du passage du soleil dans un plan vertical," *Journal de l'Ecole Polytechnique, loc. cit.*, pp. 123–35).

As drawn by Mr. Littlehales the chart occupies a square of 15-in. side. From 5° to 175° it is graduated to single degrees, and over a large part of the scale can be read by estimation to 6′. Although the printing of two copies obtained from Mr. Potter, agent for Admiralty charts, Minories, London (price 2*s.* 6*d.* each), is roughly executed, the chart is capable of doing good service in providing a rapid means of checking the results of calculation. The particular cases in the solution of spherical triangles it is designed to deal with, frequently occur in the reduction of crystal measurements, and the use of the chart can be confidently recommended to crystallographers.

A. HUTCHINSON.

The Mineralogical Laboratory, Cambridge,
February 26.

Curious Markings on Chalk.

IN NATURE of March 6 there appeared a short notice of a piece of chalk said to be carved to represent a mammoth. This specimen was described and figured by Mr. Reid Moir in the February issue of *Man*, p. 17, pl. B. Examination of the figures there given shows that the object is nothing more than a somewhat imperfect natural cast of a chamber of the shell of an Ammonite. It is significant that in some parts of the country where such casts are not uncommon the quarrymen call them "pigs."

CHAS. W. ANDREWS.

British Museum (Natural History), March 8.

Globular Clusters, Cepheid Variables, and Radiation.

(1) THE determination of the past duration of solar radiation, and, consequently, the problem of the age of the inhabitable earth, imposes upon theories of radiation a difficulty the magnitude and fundamental importance of which appear to be too infrequently considered. The difference in the time-scales derived from the gravitational theory of solar energy and from geological and astronomical observation is not one of a few per cent. (or less) of the basic quantities involved, as is generally the case with the discrepancies that have led to conspicuous modifications of radiation theories; the discrepancy is rather a matter of a hundred to one, or even of a thousand or more to one. A more glaring disagreement could scarcely be imagined between a generally accepted and thoroughly workable theory on one hand, and, on the other, a mass of observation now too extensive and varied to be denied and some equally formidable physical laws.

Until recently the arguments for a long time-scale have been mostly geological and biological, and they have not been strongly insisted upon; imperfections in the geological records have been held to minimise the disagreement with the Helmholtz-Kelvin contraction theory of the sun. Similarly, the arguments for the short time-scale have not been too convincing, to some geologists at least, because of the promising possibility of finding new sources of energy or other escape from the physical theory. Hence on both sides of the question there has been a feeling of uncertainty relative to the validity and finality of opposing arguments, and on neither side has the discrepancy been strongly emphasised as a critical point for theories of radiation and the structure of matter.

(2) In recent volumes of NATURE the limited possibilities of the gravitational contraction of the sun in the problem of the age of the earth have been argued anew by Lindemann,[1] Jeans,[2] and Eddington.[3] The energy of contraction, as is well known, is essentially self-regulating for gaseous stars, and its evaluation is a clear and straightforward process. The available supplementary sources of energy seem incompetent; the heat of chemical combinations, an assumed increase in the specific heat, any definitely recognised atomic supply—all such as these appear quite insufficient to affect the problem. In fact, Jeans has shown by a calculation, remarkable both for its brevity and directness, that the total capacity of all electrical sources of energy (including the chemical and radio-active) must be comparatively small. He concludes: "It accordingly looks as though the Helmholtz contraction will provide much more energy than any other source, and we must apparently adjust our views to the time-scale set by the contraction theory."

Eddington[4] has pointed out important objections to the rather bizarre conception of obtaining great stores of energy through the gradual annihilation of matter, positive and negative electrons occasionally annulling each other.

Hence, unless we question, in some manner wholly new, the strict application of the gravitational theory, we may feel now more certain than ever that the sun could have radiated at the present rate for only a few million years.

(3) The main purpose of this note is to remark that recent developments in stellar astronomy make it unnecessary to rely on geological evidence alone for the proof of a vastly longer duration of solar radiation than the gravitational hypothesis admits. Thus the argument need no longer involve only the indefinite opposing of the tenets and conclusions of one science

[1] Vol. xcv., pp. 203, 372 (1915).
[2] Vol. xcix., p. 444 (1917).
[3] Vol. xcix., p. 445 (1017).
[4] *Loc. cit.* and Monthly Notices, vol. lxxvii., p. 611 (1917).

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